together with certain abrasive rim limitations. All claims of th application are dir cted specifically to ***dressing tools*** of the class r cited in the claims, i.e., rotary, profile dressing, rigid, disc shaped core, and abrasiv rim on at least one surface of the periphery of the core.

Thus, Applicants cannot understand the Examiner's comments that "Applicant's arguments filed 2/2/00 have been fully considered but they are not persuasive. Applicant argues that Matsuda in view of Naumann et al. do not disclose a dressing tool for refurbishing the grinding face of a grinding wheel. The examiner feels that this issue is moot because it is not suggested or claimed in Applicants' claims."

Dressing tools are recited expressly in Applicants' claims and they are the focus of the background discussion in the specification. See page 1, lines 1-17, pages 3-4, the Description of the Drawings, and Fig. 1. The invention resides within this defined class of abrasive tools. Given the contents of Applicants' specification, the recitation of a rotary dressing tool in the preamble of Applicants' claims is a structural limitation. The Court of Appeals for the Federal Circuit has ruled that such structural limitations are allocated significant weight in the evaluation of patentability over the prior art. Corning Glass Works v. Sumitomo Electric, 9 USPQ2d 1962, 1966 (Fed. Cir. 1989).

One skilled in the art of abrasive tool technology recognizes dressing tools as a separate class of tools from saw blades (e.g., Matusda tools), grinding machines (e.g., Naumann) and internal diameter grinding wheels (e.g., Fitzpatrick). Appendix A attached to this amendment contains a copy of the Table of Contents and a page on Rotary Profile Dressing Tools from the Norton Company Specification Manual which shows dressing tools are grouped as a separate class of tools. Samples of product bulletins for saw blades and grinding wheels are contained in Appendix B. These samples illustrate some of the differences among these classes of tools, e.g., saw blades cut a slot into a workpiece, whereas dressing tools grind a small amount of surface material from the grinding face of a grinding wheel.

The Matsuda Patent

Applicants refer the Examiner to the comments submitted in the previous amendment filed 2/2/00 and request a reconsideration of the comments in view of the description of the invention set forth above. Applicants note, with appreciation, that the Examiner has not continued in a rejection of claims 11 and 12 over the Matsuda patent.

The Fitzpatrick Patent

Fitzpatrick describes internal diameter (ID) grinding tools. These tools comprise an expandable helical coil having an outer abrasive strip. The coil is mounted on a tapered arbor (i.e., a shaped rod core) having a central axis of rotation and an outer surface of a frustoconical shape. The ends of the coil are attached to the tapered arbor with threaded nuts. These tools are used to grind holes in workpieces. Fitzpatrick does not disclose dressing tools used to refurbish the grinding faces of grinding wheels. Fitzpatrick does not disclose disc-shaped cores having abrasive grain brazed to the perimeter surface of the core. A single coil "insert" is mechanically attached to the tapered arbor.

In contrast, Applicants claims 11 and 12 recite a disc-shaped core having a plurality of abrasive inserts mechanically fastened to the periphery of the disc-shaped core.

As noted on page 1, lines 10-17, prior art dressing tools are made by hand setting individual diamond abrasive grains into a cavity of a mold and then pressing powdered metal around the diamond. Other, equally difficult and expensive processes are used in the industry to make rotary dressing tools.

Thus, it was quite surprising that Applicants could achieve the precision needed for a dressing tool using the claimed construction of a plurality of abrasive inserts mechanically fastened to the periphery of the disc-shaped core. None of the prior art suggests inserts made with either a single layer of diamond grains or diamond film inserts are fixed in place with an active metal braze. The active braze gives the diamond layer the mechanical strength needed to maintain the tip radius for precision dressing and the capacity to dress the grinding wheels over a commercially acceptable life. This combination has never been suggested for rotary profil dressing tools.

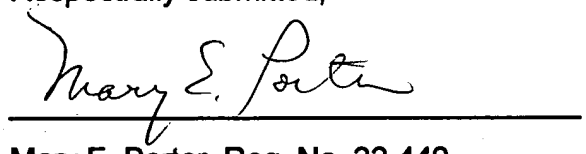
The Naumann teaching to use an active braz is drawn ntirely from U.S. Pat. No. 5,492,771 to Lowder et al ("Lowder"), a patent cited by Applicants in their information disclosure statement. Naumann in combination with Fitzpatrick suggests nothing about rotary profile dressing tools.

Furthermore, in Claims 11 and 12, Applicants claim a rotary profile dressing tool made with abrasive inserts designed to be mechanically fastened (e.g., bolted) onto a core to form the dressing face. None of the references teach this construction. This innovation is a significant improvement because the precise machining of the core component needed to maintain the precise shape of the grinding wheel face is costly and the inserts can be expected to significantly reduce the cost of refurbishing these tool cores.

CONCLUSIONS

In view of the amendments and remarks submitted in this amendment, Applicants respectfully request an allowance of claims 1-12.

Respectfully submitted,



Mary E. Porter, Reg. No. 33,440
Attorney for Applicant
Phone No. 508-795-2555
Fax No. 508-795-2653

September 29, 2000
Norton Company
One New Bond Street
Number 15138
Worcester, MA 01615
#30249.02

APPENDIX A

NORTON

SPECIFICATION MANUAL

Segments
Cut-Off Wheels
Grinding Wheels
Superabrasive Wheels
Sticks & Stones
Dressing Tools

For Distributor Use Only — Not For Distribution To Customers

Depend on your Norton Distributor for the latest in abrasive products.

He keeps a large inventory of Norton wheels, abrasives and grinding accessories for fast delivery. Your Norton Distributor also offers money-saving advice. His grinding specialists are Norton-trained, skillful application engineers, ready to help you select the best products to meet each of your grinding needs.

INDUSTRIAL DISTRIBUTORS

DISTRICT SALES OFFICES

AKRON AREA
1920 Georgetown Rd.
Hudson, OH 44236
(216) 653-9255

ATLANTA
500 Northridge Rd.
Suite 640
Atlanta, GA 30350
(404) 587-4695

CHICAGO AREA
3601 Algonquin Road
Suite 624
Rolling Meadows, IL 60008
(312) 394-3200

CONNECTICUT AREA
Oak Park, Bldg. 3, Suite 18
141 Durham Rd.
Madison, CT 06443
(203) 245-7719

DALLAS AREA
101 W. Renner Rd.
Suite 260
Richardson, TX 75082
(214) 644-1299

DETROIT AREA
The Cousins Building
28200 Orchard Lake Rd., Suite 111
Farmington Hills, MI 48334
(313) 855-5010

HIGH POINT AREA
7901 Industrial Village
Greensboro, NC 27409
(919) 658-9561

INDIANAPOLIS
6415 Castleway Drive
Suite 106
Indianapolis, IN 46250
(317) 849-7800

LOS ANGELES AREA
14103 Borate St.
Santa Fe Springs, CA 90670
(213) 921-3141

MEMPHIS AREA
65 Germantown Court, Suite 304
Cordova, TN 38018
(901) 753-1460

NORTHERN NEW ENGLAND AREA
300-C W. Main St.
Northborough, MA 01532
(508) 393-8664

OMAHA
12728 Augusta Ave.
Suite 100
Omaha, NE 68144
(402) 334-7695

PHILADELPHIA AREA
120 Uwchlan Ave.
Suite 200
Exton, PA 19341
(215) 363-2755

PITTSBURGH AREA
101 N. Meadows Dr.
Suite 131
Wexford, PA 15090
(412) 935-9600

SAN FRANCISCO AREA
9 Crow Canyon Court
Suite 205
San Ramon, CA 94583
(415) 838-1333

IN CANADA
Norton Canada Inc.
3 Beach Rd.
Hamilton, Ontario
L8L 7Y5
(416) 547-2551

NORTON

Abrasives Marketing Group One New Bond Street Box Number 15008 Worcester, MA 01615-0008

Form 5967 4-92

TABLE OF CONTENTS

SUPERABRASIVES SECTION

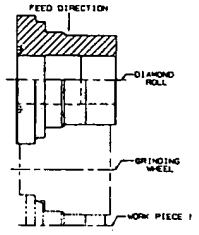
CONVENTIONAL ABRASIVES SECTION

10. ROTARY DIAMOND DRESSERS

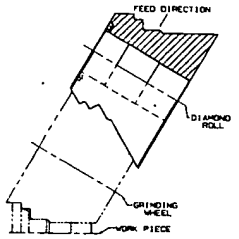
A rotary diamond dresser is custom engin ered to do a superior job of consistently imparting the required form onto the grinding wheel. A rotary dresser replaces a stationary dressing tool and requires a powered drive spindle and infeed system in most applications.

- The roll design may use 5% to 50% of the part tolerance, depending on the customer's processes, operational methods, or subsequent assembly requirements.
- The centerline positioning of the part, grinding wheel, and rotary dresser as mounted on the spindle is critical in designing the proper roll.

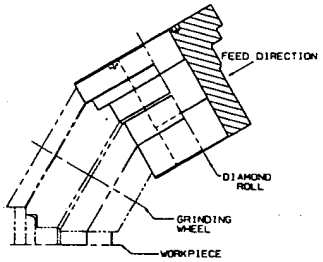
A.



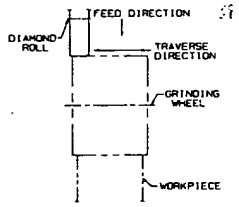
B.



C.



D.



If illustration B or C illustrates the relationship, indicate whether a 15°, 30° or 45° angle.

- Rolls are also designed around the drive spindle. Engineering must consider the shaft diameter, the size of the cavity, and how the roll is fastened before determining the roll's diameter.
- Speed (RPM and SFPM) and rotational directions are also considerations. The rotational speed may be fixed or variable depending upon the method used to drive the spindle. The method and construction of the drive motor may determine if single or bi-directional rotation capabilities exist. These two factors relate to the dressing ratios and forc s used to obtain optimum grinding performance.

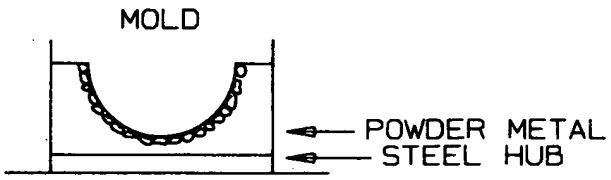
The sp ed and rotational direction of the roll in relationship to the grinding wheel create different conditions. The speed of the grinding wheel and roll create truing forces. The direction of these impact how well the wheel removes stock and produces a desir d finish.

The grinding wheel specification, coolant, the condition of the machine, and material being ground may require fine tuning to achieve the optimum results.

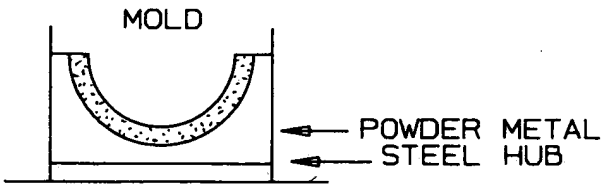
Many end users develop their own designs of rotary dressers based on their experience. Necessary design information may be taken from this blueprint or an existing rotary dresser. Either can be forwarded to Customer Service in Arden for a quotation.

Diamond Roll Types

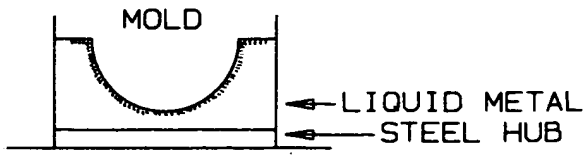
1. HAND SET SINTERED — Hand set is a method of arranging a single layer or whole processed diamonds in either a bi-direction pattern or no pattern. The infiltrated process uses temperatures from 1500° to 2000° in the sintering method.



2. RANDOM SET SINTERED — Random set is a method of placing a layer of diamonds in a roll by concentration and mesh size. Bonded at temperatures from 1500° to 2000°.



3. RANDOM SET REVERSE PLATED — The layer of diamond, placed by concentration and mesh size, is bonded using electrodes, nickel and temperatures under 200°.

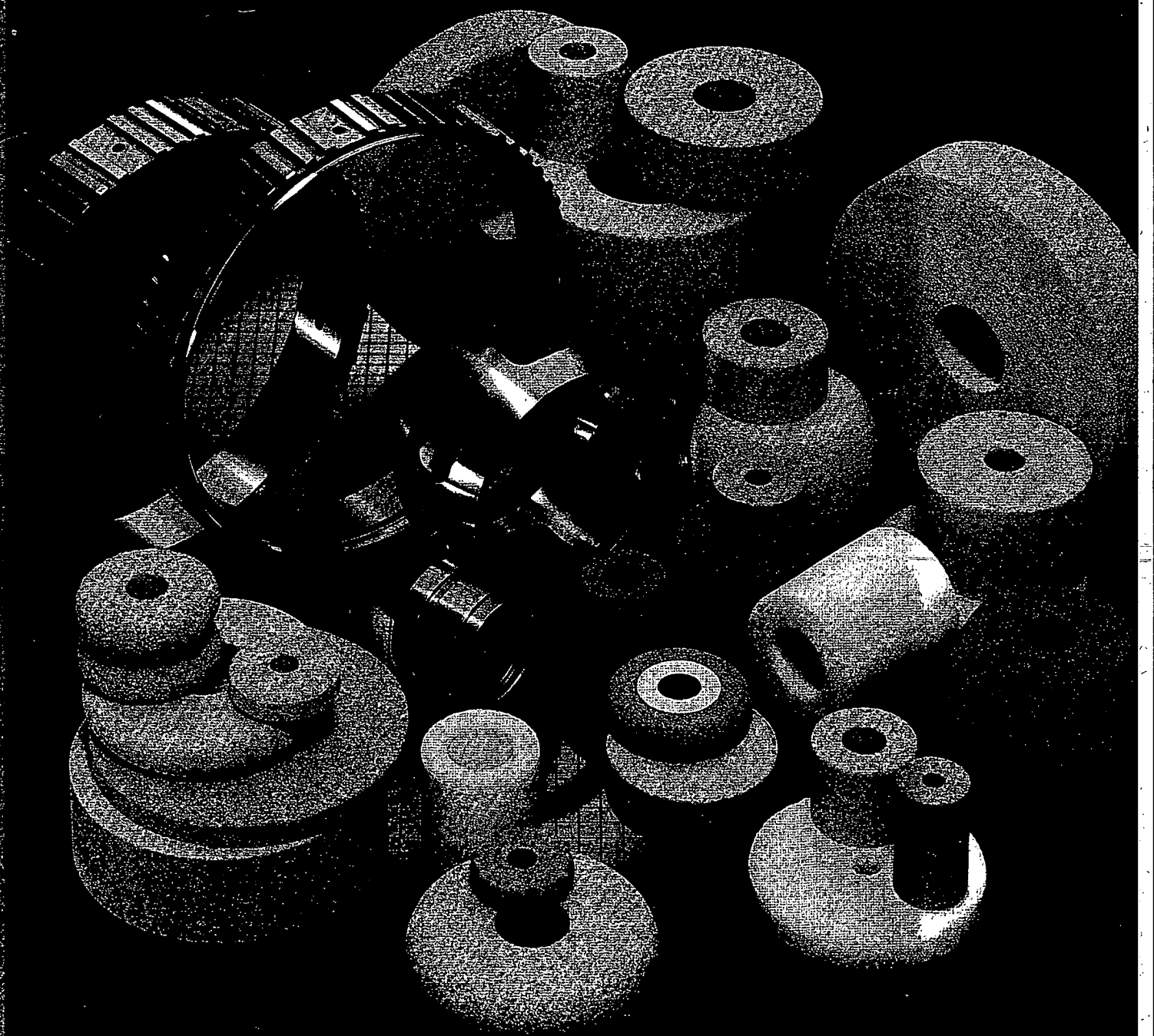


APPENDIX B

WITH TARGA™ ABRASIVE

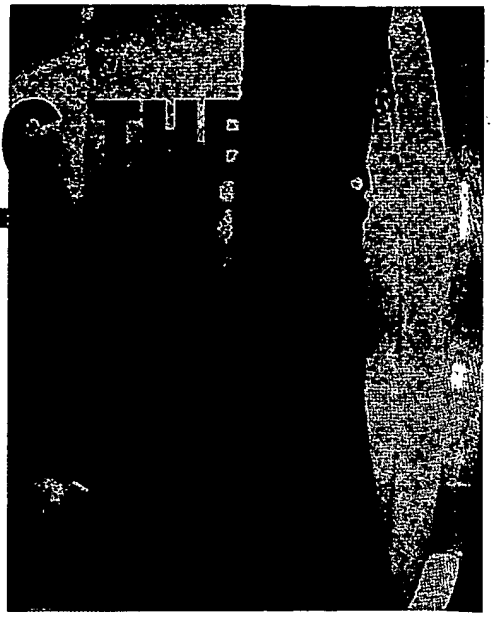
NORTON ID & RACE WHEELS

High Performance Small Diameter Wheel



NORTON

FOR ID & RACE GRINDIN
ONLY NAME YOU NEED T
KNOW IS NORTON



Norton offers the most complete line of value priced to high performance small diameter ID & Race wheels including the VFL press-to-size wheels and a broad availability of products for applications requiring more specific final dimensions. The ID and race wheel offering is available in three different performance oriented abrasive types:

5TG Targa is a new premium "ceramic abrasive" with a special shape that allows for greater penetration of the workpiece and significant reduction in wheel dressing. 5TG abrasive delivers superior productivity and part quality for bearing, hardened tool and stainless steel.

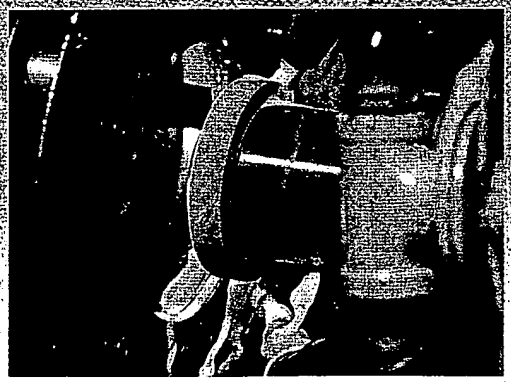
Utilize 5TG for faster stock removal, reduction in cycle time, increased parts ground and lowest total cost per part. 5TG provides the most productive solution for most applications.

32A Alundum® abrasive has been the standard for grinding a variety of materials ranging from bearing steels to cast iron. The monocrystaline structure of the grain results in greater form holding on complex parts. Dressing per wheel can be minimized and the dress compensation can be significantly reduced over conventional aluminum oxide abrasives. Norton 32A abrasive provides a superior performance at a non premium price.

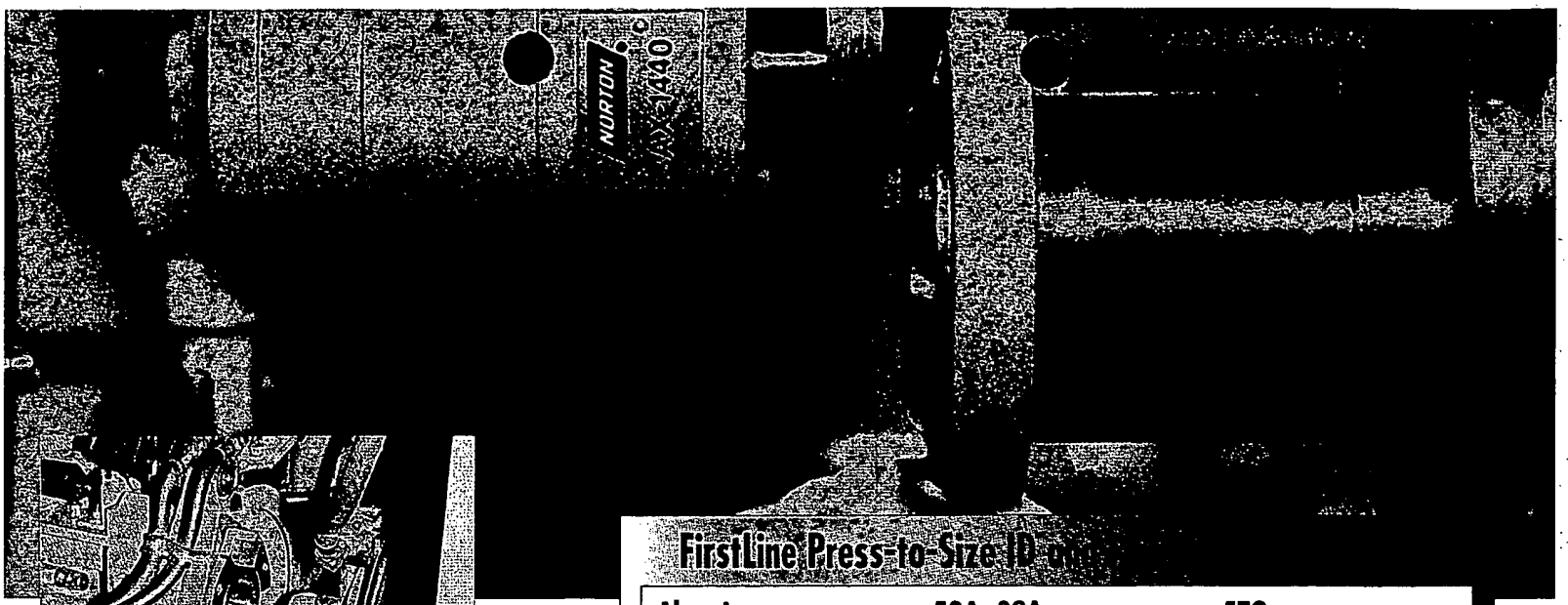
53A Alundum abrasive is especially suited for grinding mild steels, cast iron, hardened steel and heat sensitive alloys. 53A combined with superior Norton VFL bond can be utilized for grinding workpieces where metallurgical damage must be avoided. For versatility and lowest per wheel cost, choose Norton 53A.

Make Your First Choice Norton FirstLine VFL Press-to-Size Wheels

All three abrasive types 5TG, 32A and 53A are available with VFL bond. VFL bond has been chosen because it maximizes the performance in internal and race grinding applications.



Norton FirstLine ID and race wheel line includes over 1,000 pressed-to-size molded wheels available in size from .172 diameter to 2.907 Type 1 wheels and .407 to 2.782 Type 5 wheels. Norton FirstLine press-to-size wheels provide the most economical grinding solution for your small diameter grinding applications. Plus FirstLine wheels are available with the shortest lead times so you can generate additional savings by reducing inventory requirements. FirstLine wheels are available with VFL bond which has been chosen exclusively for ID and race wheels. Your Norton representative can help you determine if a FirstLine wheel is available in a size to meet your needs.



Norton Targa Breakthrough Technology – New Expanded Availability

Norton Company's proprietary, breakthrough Targa (TG) abrasive technology delivers unrivaled grinding productivity and part quality. No other conventional abrasive can match the metal removal rate of TG wheels. In grinding tests, TG wheels kept their form longer and generated more good parts in the shortest cycle time and with the lowest power draw. 5TG, 120 grit wheels have been available in the FirstLine press-to-size product line. **Now 5TG, 120 grit abrasive is available with VS and VSB bond in a non press-to-size availability.**

32A and 53A Non Press-to-Size Wheels

To ensure that you can select the most appropriate cost effective small diameter wheel for your application, Norton continues to offer 32A and 53A in a non press-to-size, made to size specifications with VBE bond. This allows you to choose from the broadest possible spectrum of price, performance and size ranges.

FirstLine Press-to-Size ID and

Abrasives	53A, 32A	5TG
Grit*	46-120	120**
Grade	K-P	I-M
Structure	not shown	not shown
Bond	VFL	VFL
Wheel types	01, 05	01, 05
Speed *Higher wheel speeds are available on request.*	8500	8500

** Availability of grit sizes may be limited. Consult [illegible] size availability for specific size ID and Rate [illegible]*

***5TG, 120 grit promotes finishes typically obtained [illegible]*

FirstLine Tolerances

If Diameter is:	Diameter	Thickness	Hole
.532" and less	±.003	+.004 -.000	+.001 +.006
.532-2.907	±.005	±.005	+.001 +.006

53A, 32A & 5TG Non Press

Abrasives	53A, 32A	5TG-NEW
Grit*	46-120	120**
Grade	K-P	I-M
Structure	not shown	not shown
Bond	VBE	VS, VSB
Wheel types	01, 05	01, 05 *(special faces on 01 available)*
Speed *Higher wheel speeds are available on request.*	8500	up to 8500 - VS bond 8500 - 12,000 - VSB bond
Size Diameter:	Std.	min. 1/2" dia. - max. 4-1/2" dia.
Thickness:	Std.	max. 2" <1" dia. max. 3" >1" dia., 4-1/2" dia.

Tolerances are dependent on whether the wheel [illegible]

***5TG, 120 grit promotes finishes typically obtained [illegible]*

IMPROVE YOUR PERFORMANCE WITH NORTON ID & RACE WHEELS

Available In Most Popular Sizes And Specifications.

Ask your Norton distributor about testing new Norton ID & Race wheels at your site, using your own machines and tools. You'll save time and money - while increasing your productivity. Most popular sizes and specifications are available. For the name of the Norton distributor nearest you, call the Norton Abrasives Marketing Group at 1-800-446-1119.

GOOD BETTER BEST	For most abrasive applications, Norton Company offers up to three product performance levels - GOOD, BETTER, and BEST. Norton 53A ID and Race wheels are in the GOOD tier. 32A ID and Race wheels are in the BETTER tier. 5TG ID and Race wheels are in the BEST tier.

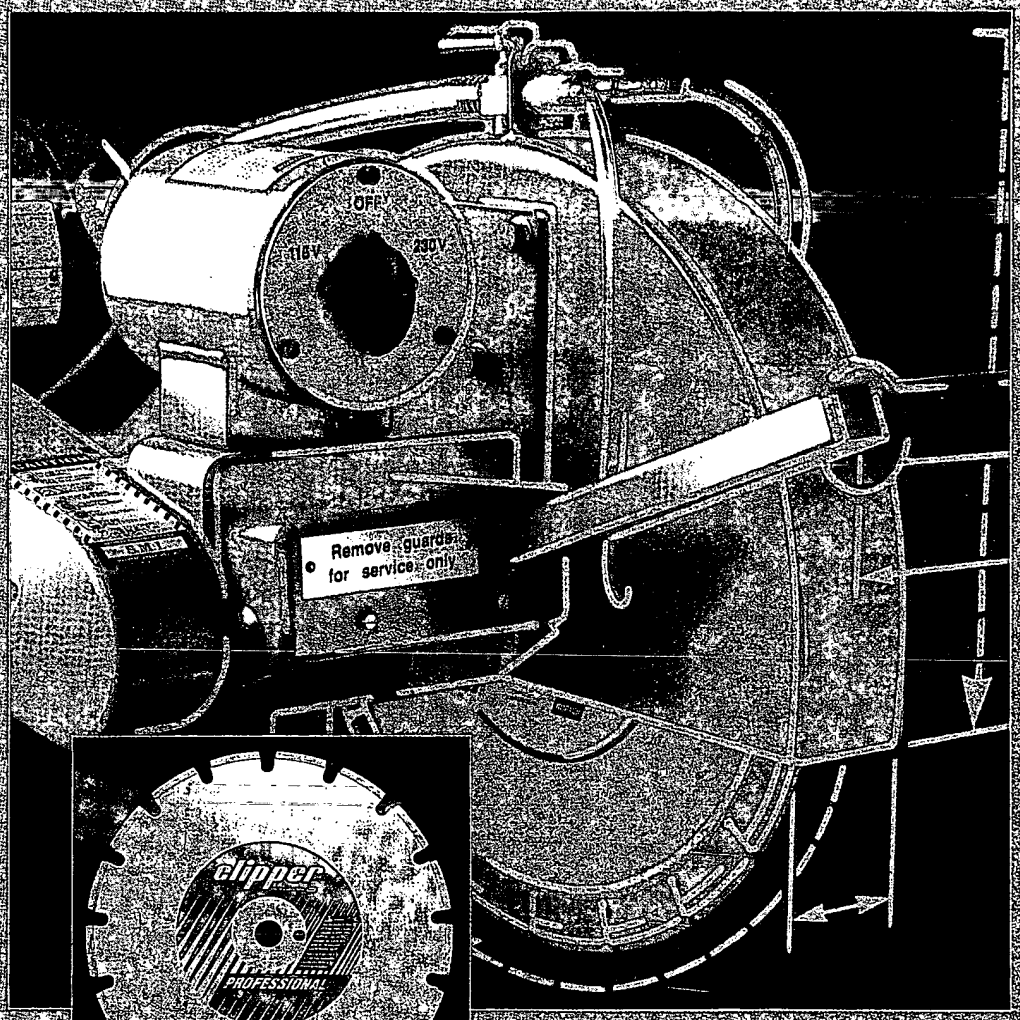
NORTON

Lowering your costs, not your expectations.™

I·D·A Industrial Distribution Association

NORTON COMPANY Abrasives Marketing Gr up 1 New Bond Street, Worcester, MA 01615-0008

clipper



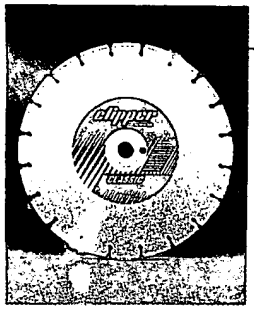
MASONRY

CUTTING PRODUCTS

A PRODUCT OF NORTON COMPANY

clipper

Diamond Blades



CLASSIC DIAMOND BLADES

The Classic diamond blade line represents a complete range of wet and dry masonry, high speed, and refractory diamond blades for sawing glazed structural tile, brick, and block. Combination blades are also available for dual purpose sawing applications.

PROFESSIONAL DIAMOND BLADE

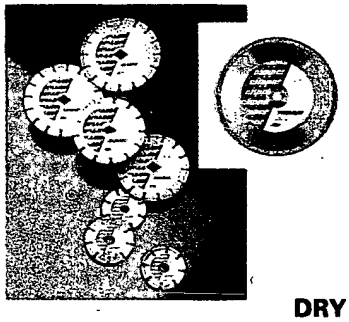
The Professional diamond blade line features top quality diamonds and superior product engineering. These factors combine to provide the user with the ultimate in wet and dry diamond sawing value through high productivity and extended wear.

CHOPPER MULTIPURPOSE DIAMOND BLADES

The Chopper multipurpose diamond blade is engineered for use in a wide range of applications. This versatile specification is suitable for both wet and dry cutting operations on high speed saws, low horsepower concrete saws, and masonry saws.

BULLY DIAMOND BLADES

The Bully diamond blade family represents the latest advancement in diamond blade technology. Specifications are available for high speed saws and dry sawing of hard brick. All Bully specifications feature SpeedBeads which are ceramic abrasive crystals that enhance cutting speed and blade life.



DRY PORTABLE DIAMOND BLADES

Segmental Classic and continuous rim Premium specifications are available for sawing masonry materials with hand-held circular saws.

DRY DIAMOND CUP WHEELS

Dry Diamond Cup Wheels are available in both single and double row diamond segment configurations for fast, smooth grinding of brick and block.

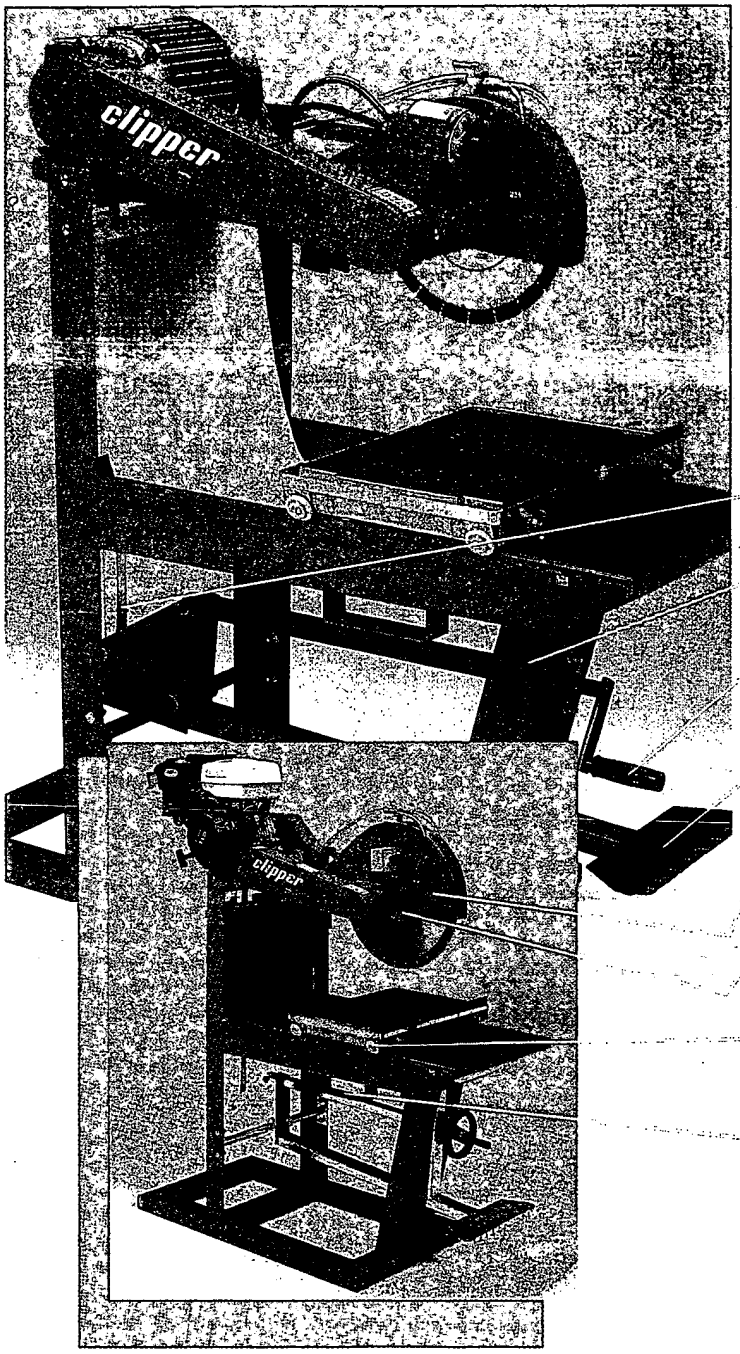
WET CUTTING TILE BLADES

Clipper wet cutting, continuous rim tile blades are ideal for fast, chip-free sawing of ceramic tile products.

NOTES:

clipper

Clipper BBL Electric Masonry Saw



Clipper BBL Gas Masonry Saw

BBL Classic Saw

ELECTRIC MODELS

1) Premium 3 hp and 5 hp electric motors with overload protection to resist motor burn-out.

GAS MODELS

2) Premium 5 hp and 11 hp Honda gasoline engines for reliable performance.

ALL MODELS

3) Adjustable depth stop assures consistent cutting depth.

4) Heavy-duty steel frame and legs for maximum durability.

5) Raising and lowering crank with folding handle for easy head adjustment.

6) Spring-loaded foot pedal permits smooth, nearly effortless cutting.

7) Stay-level blade guard for convenience, comfort and increased working visibility.

8) Enclosed blade shaft protects bearings and operator. Removable plate for easy inexpensive bearing replacement.

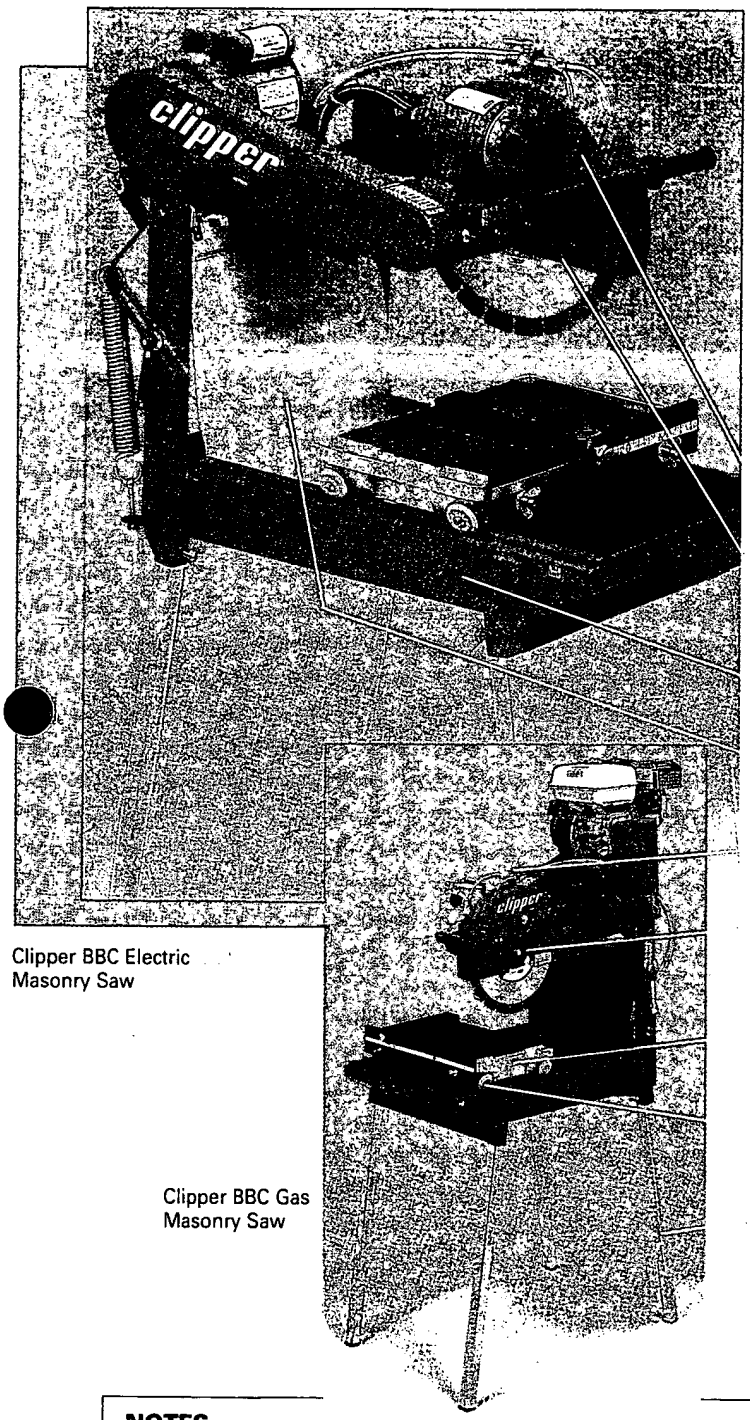
9) TILT-LOCK™ cart wheels provide greater stability and reduce conveyor cart rocking.

10) Fork lift brackets for easy transport.

11) Available with 14" or 20" blade capacity.

NOTES:

clipper



Clipper BBC Electric Masonry Saw

Clipper BBC Gas Masonry Saw

BBC Compact Saw

ELECTRIC MODELS

1) Premium 1.5 hp and 2 hp electric motors with overload protection to prevent motor burn-out.

2) Dual voltage switch permits 115 volt or 230 volt operation.

GAS MODELS

3) Premium 5 hp Honda gasoline engines for reliable performance.

4) Jackshaft transmits full power to blade shaft.

ALL MODELS

5) Removable cutting head for easy portability and storage.

6) Stay-level blade guard for convenience, comfort and increased working visibility.

7) Durable sloping water pan directs water to rear of saw for easy removal.

8) Open back design permits rip cutting of larger materials.

9) Adjustable water supply encourages better blade productivity.

10) Enclosed blade shaft protects bearings and operator. Removable plate for easy inexpensive bearing replacement.

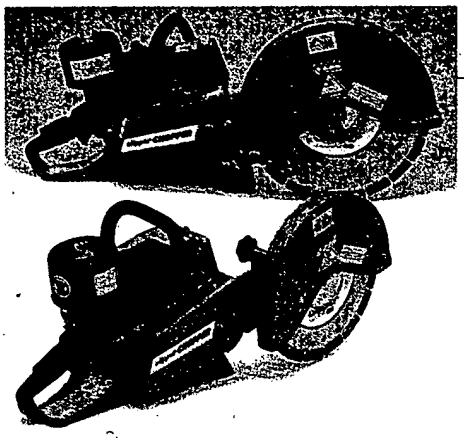
11) Heavy-duty, cast aluminum conveyor cart for extra durability. Non-slip rubber top and water flow control vents.

12) TILT-LOCK™ cart wheels provide greater stability and reduce conveyor cart rocking.

13) Adjustable, removable legs permit compact, easy storage and mobility.

NOTES:

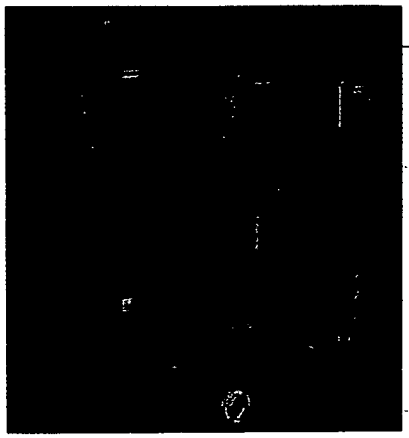
clipper



CHOPPER HIGH SPEED CUTOFF SAWS

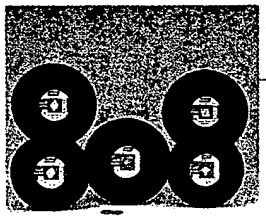
Two durable models are available in 12 and 14 inch sizes. Three-stage filter assemblies ensure maximum protection against dust.

NOTES:



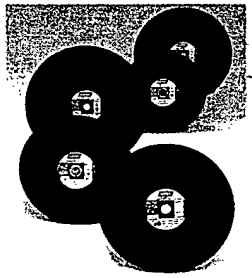
DRY DIAMOND CORE BITS

The Clipper dry diamond core bit line represents an outstanding value when used on right-angle grinders to drill through masonry materials.



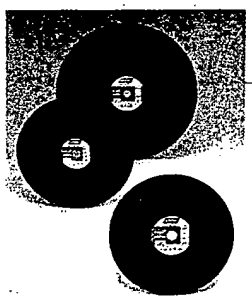
SMALL DIAMETER ABRASIVE BLADES

Available in 7" and 8" diameters, Clipper portable abrasive blades are ideal for cutting brick and block with hand-held circular saws.



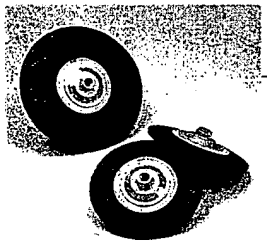
HIGH SPEED ABRASIVE BLADES

HSC and HSM blades cut concrete, masonry, metal and ductile with hand-held, high speed saws.



MASONRY ABRASIVE BLADES

Clipper reinforced masonry abrasive blades are designed for dry sawing brick and block. These tough blades provide an exceptional value for short-term, economical sawing applications.



PORTABLE ABRASIVE PRODUCTS

Clipper raised hub discs are perfectly suited for grinding mortar, paint, and surface discolorations from masonry products.

NORTON CONSTRUCTION PRODUCTS, P.O. Box 2898, Gainesville, GA 30503, Phone: (800) 554-8003, FAX: (800) 443-1092